

Zero Retries issue 0149 2024-04-26

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 1500+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - <https://www.zeroretries.org/p/zero-retries-0149>

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Paid Subscribers Update

My thanks to **Andrew Herrington KG5JNC** for becoming a Paid Subscriber to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 29** for becoming a Paid Subscriber to Zero Retries this past week!

Financial support is a real vote of confidence for continuing to publish Zero Retries.

Major Conference Countdowns

- [Hamvention 2024](#) in Xenia, Ohio, USA on 2024-05-17 thru 19, in 03 weeks!
- [HAM RADIO 2024](#) in Friedrichshafen, Germany on 2024-06-28 thru 30, in 06 weeks!
- [JARL Ham Fair 2024](#) in Tokyo, Japan on 2024-08-24 and 25, in 17 weeks!

See other events at the Zero Retries Guide to Zero Retries Interesting Conferences.

Presentation at LinuxFest Northwest on Saturday 2024-04-27

I will be a presenter at [LinuxFest Northwest \(LFNW\) 2024](#) tomorrow (Saturday) at 14:30 - 15:30 in room DMC 140 at Bellingham Technical College in Bellingham, Washington USA. The subject of my presentation is on the schedule as “Amateur Radio and Linux”, but it was supposed to be (and will be):

Amateur Radio and Open Source (Not Just Linux)

My presentation will be a cursory overview of Amateur Radio activities and highlight a number of significant open source projects and what techies can do to experiment... *hack around*... beyond what's possible / allowed with low-power unlicensed systems such as Wi-Fi, Bluetooth, and LoRa / Meshtastic. I'm just trying to get the techies at LinuxFest to understand that Amateur Radio *in the 2020s* is technical, fun, and you can learn a heck of a lot about radio technology with Amateur Radio.

LFNW is a favorite of techies in Western Washington and Southwest British Columbia, and even draws from Portland, Oregon which is a six hour drive away. It's one of the reasons that I became so familiar and fond of Bellingham when it came time to decide on a place to relocate when we decided to leave the Seattle metro area.

Please look for the Zero Retries hat and say Hi!

Presentation at RATPAC on 2024-05-08

I will be the presenter at the Wednesday session of RATPAC (Radio Amateur Training Planning and Activities Committee) videoconference training series on 2024-05-08.

The topic of my presentation will be:

Tracking technological innovation in Amateur Radio - the Zero Retries newsletter

Mostly I want to use this presentation to highlight some of the more interesting technological innovation that's underway in the 2020s.

Go to the [RATPAC](#) page and scroll down for the link for my presentation.

Compensation for Favorable Mention in Zero Retries? Nope.

A Zero Retries reader mentioned not too long ago that “You must be getting all kinds of free stuff for the nice

mentions of products in Zero Retries”.

Actually... no.

To date, I’ve accepted two (pretty minor) “freebie” products and a *generous* donation of several radios modified for data use from Tadd Torborg KA2DEW. When I actually do use those (and perhaps future) “freebie” products and write about them in Zero Retries, I’ll disclose that those items were donated.

First, I don’t ask. I don’t want there to be an expectation (or a suspicion) of paying for mentions in Zero Retries. Unless otherwise noted, I pay full price for the products that I want to experiment with and use.

Second, small vendors of Zero Retries Interesting products in the Amateur Radio market have thin profit margins as is without giving away free stuff. I get it - it’s a struggle for small vendors to stay in the Amateur Radio market. Just like optional paid subscriptions are a “signal” to Zero Retries that the content has value, my purchases to small businesses in the Amateur Radio market, like recently to [Zum Radio](#), [KiwiSDR](#), and [RPC Electronics](#) is a signal to them that their products are useful and valuable.

In the meantime...

Next week will be a bit of travel to finally meet Pseudostaffer Orv Beach W6BI in Vancouver, British Columbia.

73,

Steve N8GNJ

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Good Presentation on CATS

By Steve Stroh N8GNJ

Stephen Downward VE9QLE did a presentation on Communication and Telemetry System (CATS) to [Radio Activities Training Planning and Activities Committee \(RATPAC\)](#) weekly videoconference.

[CATS](#) is a new Amateur Radio data communications system that’s somewhat modeled on Automatic Packet Reporting System (APRS). CATS is a “clean sheet of paper” rethinking of the paradigms underlying APRS and that VE9QLE has launched CATS is testimony to the culture of technological innovation that Amateur Radio *continues* to experiment with new technology and paradigms like CATS.

The [slide deck](#) from this presentation is also available from RATPAC.

Also, there's an interesting article on Hackaday:

[CATS: A New Communication And Telemetry System](#)

In the chat, I asked VE9QLE if the mobile CATS radios could act as standalone (CATS) digipeaters, and he confirmed that they could.

Kudos, again, to VE9QLE on creating and evangelizing CATS.

Jam-Resistant American Radio Keeps Ukraine's Long-Range Drones Flying

By Steve Stroh N8GNJ

Includes excerpts from [Jam-Resistant American Radio Keeps Ukraine's Long-Range Drones Flying](#) in Forbes by David Hambling 2024-04-17. If you click on the link, I recommend using your browser's "Reader" setting as the screen quickly fills with interstitial advertisements.

Parikh says there are three basic approaches to dealing with radio interference, and they use all of them. One is filtering, so that the receiver can block out everything except the exact wavelength being used to communicate. Another is using multiple bands and the third is hopping to a different band where [there] is no interference.

...

Parikh says that jammers are constantly evolving, but they are staying a step ahead with new techniques to defeat them. The time to switch to a new frequency is now measured in milliseconds.

...

Parikh describes Mesh Rider as a hybrid software-defined radio. While the theoretical, ideal

software-defined radio is capable of communicating with any protocol on any wavelength, in practice it is constrained by hardware. Doodle Labs' radio uses six different bands in a patented design claimed to be the first to offer this versatility.

I posit that Parikh chooses to omit a fourth approach to dealing with jamming - *focus*. For example, if a drone has a directional antenna system, flying from friendly territory (West) into enemy territory (East) it can focus its communications link West and ignore the (jamming) transmissions from the East. I'll guess that Parikh forgoes this approach because it's not currently practical to implement directional antennas on small, inexpensive drones¹. Even "solid state" phased array antenna techniques require significant size, electrical power, and compute capability that would require a large drone with a significant power budget.

One of the challenges with such "rapid channel", and now rapid *band* switching is for the two ends of the communications link to stay in sync to maintain two-way communication. I'll guess that one of the key elements of the Doodle Labs units (sophisticated software) is that the drone unit *autonomously* selects the band to operate on, switching either constantly, or as necessary when encountering jamming. This could be made to work because the base unit simply listens, simultaneously, to all possible bands (using inexpensive software defined receivers), receives the (authenticated, no doubt) transmission from the drone, and communicates back on that band.

Drones on the battlefield is an example of literally life and death depending on having superior... or at minimum... *survivable* radio technology. (So is battlefield tactical communications which is mentioned peripherally in the article.) Given that the Ukrainian drones cited *are* surviving the best jamming technology that Russia can throw at them, US radio technology is winning that contest... at the moment.



Doodle Labs Mesh Rider Nano. Image courtesy of Doodle Labs.

I found it remarkable that the sophistication of [Mesh Rider](#) can be crammed into a unit as small, light, and inexpensive as the [Mesh Rider Nano](#):

And crucially, the smallest version of Mesh Rider weighs less than an ounce and costs just a few hundred dollars, making it small and cheap enough for expendable drones.

One of the limitations of Doodle Labs' approach of using off-the-shelf radio "chips" such as those from Qualcomm, is that those chips are designed for bands that are "popular" worldwide (largest possible market) such as 2.4 GHz and 5 GHz (though there is some mention of the North American 902-928 MHz band).

Doodle Labs once offered an Amateur Radio product, the DL435 420-450 MHz OFDM Transceiver. Basically, Doodle Labs used a 2.4 GHz Wi-Fi chipset and incorporated the equivalent of a 2.4 GHz to 420-450 MHz

transverter. “Green Bay Professional Packet Radio” did a [great article on this product](#) which could operate in 5 or 10 MHz channels on 420-450 MHz and could operate at speeds up to 13.5 MHz in a 5 MHz channel and 27 Mbps in a 10 MHz channel. This unit was only available for a short time and probably fell victim to the FCC bandwidth and symbol rate limits on the US 420-450 MHz (70 cm) band of maximum bandwidth of 100 kHz and maximum symbol rate of 56 “kilobaud”.

I see a number of crossovers in Amateur Radio to the technologies being implemented in the Mesh Rider systems, including the “monitor everything, simultaneously” approach (which we can now do with [ka9q-radio](#) and inexpensive Software Defined Receivers), ability to dynamically use multiple bands depending on requirements of the moment (such as selecting 50-54 MHz to communicate with one friend, and 1240-1300 MHz to communicate with another), and of course experimentation on the “unlicensed” bands for which US Amateur Radio has overlapping allocations allowing for experimentation beyond what’s possible by “unlicensed” users and products that must adhere to “unlicensed” limitations.

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

[AREDN Release 3.24.4.0](#)

AREDN production software version 3.24.4.0 is now available, with many new features and enhancements. The AREDN team would like to thank those individuals who contributed to this release:

- Tim [Wilkinson] KN6PLV
- Paul [Milazzo] K3PGM
- Darryl [Quinn] K5DLQ
- Gerard [Hickey] WT0F
- Jacob [McSwain] KI5VMF
- Bailey [Kasin] KK6ORT
- Steve [Lewis] AB7PA

Go forth and upgrade - your network will thank you!

Presumably v3.24.4.0 incorporates the feature set of AREDN Release Candidate April 2024, which was discussed in **Zero Retries 0148**.

It’s really cool to see the major contributors to AREDN mentioned prominently. I could care less if my name / callsign ever appears on some list of Amateur Radio contest results, but having my name / callsign associated with a significant technical accomplishment like this... is (again) really cool.

Kudos to all the contributors to AREDN 3.24.4.0!

And, thanks again to AREDN Ambassador (and Zero Retries Pseudostaffer) Orv Beach W6BI for tirelessly

evangelizing the capabilities of AREDN within Amateur Radio.

[Quansheng UV-K5 TRX VHF UHF \(HF RX\) Mod Ready](#)

What is it?

This is the PRE-ORDER OF THE QUANSHENG UV-K5 Radio (DIRECT FROM FACTORY) which has been modified with the si4732 chip to receive the H.F Bands and also flashed with the firmware so as the hardware mod can work.

Modifications done to the radio:

- Modification of front end Amp (Removal of Inductor/cap and upgrade of cap)
- Removal of FM Chip and Installation of the DSP Radio AM/FM CHIP SI4732.
- Installation of the Antenna input inductor change.
- Upgrading of capacitors around the Audio chip to improve clarity.
- Upgrading of Firmware to enable new Radio chip operation.

Why did you make it?

I have been receiving requests who wants this radio but are unable to perform such mods. So i am stocking a small stock and modify them myself with all the mods available.

The modification is carried out by a professional engineer and great care is taken not to scratch the radio during the modification upgrade.

What makes it special?

The radio is supplied ready to use with all mods. These radios are supplied from the parent factory so rest assured you are getting the real one !

This is an item on Tindie from Seller “JasonKits QPR” in Malta. I thought this was notable that there is enough interest in these radios ability to be modified that a small business is stepping up to supply units with the necessary (or just nice to have) hardware modifications so the the unit is “ready for *software* hacking”.

Note that these modifications do not have anything to do with adding the ability to operate M17 mode.

[Hackaday - Reverse Engineering the Quansheng Hardware](#)

Also on the subject of the Quansheng UV-K5, Dan Maloney N7DPM on Hackaday:

In the world of cheap amateur radio transceivers, the Quansheng UV-K5 can't be beaten for hackability. But pretty much every hack we've seen so far focuses on the firmware. What about the hardware?

To answer that question, [mentalDetector] enlisted the help of a few compatriots and vivisected a UV-K5 to find out what makes it tick. The result is [a complete hardware description of the radio](#), including schematics, PCB design files, and 3D renders. The radio was a malfunctioning unit that was donated by collaborator [Manuel], who desoldered all the components and measured which ones he could to determine specific values. The parts that resisted his investigations got bundled up along with the stripped PCB to [mentalDetector], who used a NanoVNA to characterize them as

well as possible. Documentation was up to collaborator [Ludwich], who also made tweaks to the schematic as it developed.

[Expansion of the Masters Communications DRA "M" Series of Amateur Radio Audio Interfaces](#)



Masters Communications DRA-50M. Image courtesy of Masters Communications.

Kevin Custer W3KKC on the DRA mailing list:

Our DRA-50M has been a popular choice among users, and now there are more DRA's that have been added to the M Series product list. With these product additions comes a change in revision that affects all M Series products - including the original DRA-50M. Starting with REV2, the following are features included - at NO additional cost. Of the models listed below - M Series DRA's now ship automatically when you order a Standard DRA in a metal case. The website has been updated with the proper ordering links and individual product pages, and our assemblers have these products in stock.

In some cases - there are differences between the Standard DRA and the "M". These differences are explained in a linked page for each of the new DRA's.

Revision 2 Features:

- The COMM OK (blue) LED was moved to come through the front panel.
- The new front panel includes all three Status LEDs (COMM OK, HB & PTT).
- All M Series boards have the choice between Transistor and Relay PTT keying.
- The layout is more organized and allows the jumpers to be easily re-positioned without pliers.

The following DRA's are now available in the M Series. These listings are hyper-linked. Clicking on the model number takes you to the product's page at Masters Communications.

- [DRA-30M](#)

- [DRA-36M](#)
- [DRA-39M](#)
- [DRA-45M](#)
- [DRA-50M](#)

...

A transistor provides the fastest possible switching time between receive / transmit, but is incompatible with some radios. In an effort to make DRA's compatible with more radios, we're now giving the choice between transistor or relay PTT switching. The PTT keying method is selected by two mechanical jumpers - no soldering required. You choose between Transistor or Relay keying. The Relay position adds compatibility with all radios. The Transistor position insures the fastest keying on radios that are okay with electronic keying. A reed type relay minimizes the keying delay when this method must be used. Some ICOM and Commercial radios don't like a bipolar transistor, so a relay works best with them. As the software authors become more and more aggressive on timing - I wanted to retain the fastest switch time, but give the option of relay switching when is required. For radios that aren't picky - it's best to use transistor switching, but since we use a reed type relay - there is little disadvantage to this type of switching.

In my opinion, Masters Communications could have “gotten away” with perhaps two variations of their Digital Radio Adapter (DRA) series and satisfied the majority of (but not all) use cases. But instead, Masters Communications offers a wide variety of DRAs (beyond these five new models) - see the [Features Comparison](#) page.

The improvement of choice of Push To Talk (PTT; aka the “transmit” signal from the modem to the radio) circuitry in a successful product speaks volumes that Masters Communications is listening... *intently*... to their customers and providing even more capable products. Plus... I'm a sucker for blinkylights on my communications equipment (makes troubleshooting a lot more efficient)... especially *blue* blinkylights. Not to mention that sexy Blue metal case option.

[A Whole Bunch Of New Designs](#)

... For Turn Island Systems. Paul Elliott WB6CXC on his WB6CXC blog:

I've been busy. Here is the latest batch of designs that have been sent out for fab. Some are simple, some more complicated, and some are updates of earlier designs. KiCad and JLCPCB sure make this stuff easy!

Look for these designs to show up on the [Turn Island Systems](#) website.

- RX-888 External Clock Interface Kit
- Updated Clock Distribution Buffer
- AC-Coupled SMA Adaptor
- Filter/Preamplifier V2

Details and an illustration of each of these units are in the blog post. WB6CXC's productivity in creation and rapid iteration of his products continues to amaze me.

[DoD Officials Gear Up for Spectrum Sharing 'Moonshot'](#)

Mike Dano in LightReading, 2024-04-09:

Top US military officials, including DoD CIO John Sherman, said the Pentagon is embarking on a 'moonshot' to develop dynamic spectrum sharing (DSS) technology for the lower 3GHz band and other bands.

Top US military officials reiterated the Pentagon's interest in spectrum sharing during a media event this week, describing the technology as a “moonshot” that would help the US maintain an advantage against its rivals both economically and militarily.

...

The lower 3GHz band, which sits between 3.1GHz and 3.45GHz, pits the US military and the US wireless industry directly against each other. That's because the military currently operates radar and other functions in the lower 3GHz band, but the wireless industry wants to get access to the band for 5G.

According to wireless industry lobbying association CTIA, policymakers need to release the band for 5G so that the US can stay competitive on the international stage. But military officials generally argued that the band is necessary for a variety of military operations, including technologies designed to intercept missiles fired into US territory. As a result, DoD officials have voiced support for spectrum sharing but not for releasing the spectrum completely. The wireless industry generally wants exclusive access to the spectrum.

Not Amateur Radio, but illustrative of the tenacity and omnivorous requirement for more, *more*, **more** spectrum (exclusive if at all possible) for mobile telephone systems in the US.

I attended a wireless conference more than a decade ago where it was stated by a presenter that the mobile telephone industry wanted access to this portion of spectrum *so badly* that they had begun a long term (patient, but relentless) campaign against the US Department of Defense to lobby for exclusive access to it. At the time, I didn't give much credence to such a campaign. The Citizens Band Radio Service (CBRS) band - 3.55 to 3.7 GHz overlaps with a RADAR system used on US Navy carriers, but the DOD wasn't required to modify anything in their operations of those RADARs for CBRS. Apparently, these “discussions” have now entered a new phase with the DOD actively contemplating changes to its systems to accommodate the mobile telephone industry.

[IPv6 for the Remotely Interested](#)

Sedat Kapanoglu on Medium, 2024-04-16:

I've known about IPv6 for the last two decades or so, but I've never gone beyond “an overengineered solution to the IPv4 address space problem”. IPv6 was even presented as “*every atom could get its own IP address, no IP address shortages anymore*”, but I didn't know how true that was either. I occasionally saw an IPv6 address here and there because almost every device supports IPv6 today. I believe cellular network operators even default to it, so you're probably reading this on a device that uses IPv6.

Last week, I decided to learn about how IPv6 works under the hood, and I've learned quite a few interesting facts about it.

I enjoyed Kapanoglu's conversational explanation of some of the details of IPv6, which we will all be using natively by the end of the decade - IPv4 just cannot keep up with the demands of modern Internet usage.

[50 Years Later, This Apollo-Era Antenna Still Talks to Voyager 2](#)

Willie Jones in IEEE Spectrum, 2024-04-18:

DSS-43 is the only antenna that can communicate with the probe.

For more than 50 years, Deep Space Station 43 has been an invaluable tool for space probes as they explore our solar system and push into the beyond. The DSS-43 radio antenna, located at the Canberra Deep Space Communication Complex, near Canberra, Australia, keeps open the line of communication between humans and probes during NASA missions.

Today more than 40 percent of all data retrieved by celestial explorers, including Voyagers, New Horizons, and the Mars Curiosity rover, comes through DSS-43.

“As Australia’s largest antenna, DSS-43 has provided two-way communication with dozens of robotic spacecraft,” IEEE President-Elect Kathleen Kramer said during a ceremony where the antenna was recognized as an IEEE Milestone. It has supported missions, Kramer noted, “from the Apollo program and NASA’s Mars exploration rovers such as Spirit and Opportunity to the Voyagers’ grand tour of the solar system.

“In fact,” she said, “it is the only antenna remaining on Earth capable of communicating with Voyager 2.”

There’s been a lot of press of late about the Voyager 1 team [writing and uploading a software patch](#) to work around failed blocks of memory.

But I think the more remarkable accomplishment is that *we still have a communications path* to Voyager 1 and Voyager 2, thanks to antennas like DSS-43... and the people who design, build, maintain, and operate them. Can you imagine the sense of pride that the DSS-43 team feels that every bit of knowledge from Voyager 1 and 2 and other deep space probes is available to humanity *because of what they do to keep that antenna working?*

It’s one of the harder things to get new Amateur Radio Operators to understand that in a radio communications system, an optimal antenna is the primary component. If the antenna isn’t (or can’t be, by design) optimal, it’s possible to compensate for a less than idea antenna (as we’ve seen with our mobile phones, especially [direct communications with satellites](#)), with higher transmit power, a more sensitive receiver, software / protocol such as Forward Error Correction, etc. But nothing beats an optimal antenna, which is why after more of a century of Amateur Radio experimentation with antennas, we’re *still* trying new things such as [mechanically tuned antennas](#).

Leave a comment

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Join the *Fun* on Amateur Radio

If you’re not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur

Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything*!
- **Founding Members who generously support Zero Retries financially:**
 - Founding Member 0000 - Steven Davidson K3FZT
 - Founding Member 0001 - Prefers to Remain Anonymous 01
 - Founding Member 0002 - Chris Osburn KD7DVD
 - Founding Member 0003 - Don Rotolo N2IRZ
 - Founding Member 0004 - William Arcand W1WRA
 - Founding Member 0005 - Ben Kuhn KU0HN
 - Founding Member 0006 - Todd Willey KQ4FID
 - Founding Member 0007 - Merik Karman VK2MKZ
 - Founding Member 0008 - Prefers to Remain Anonymous 14
 - Founding Member 0009 - Prefers to Remain Anonymous 19
- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your [QRZ](#) page (or other web presence) and include a link:

<https://www.zeroretires.org>
- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- [Dan Romanchik KB6NU](#) mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Jeff Davis KE9V](#) also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Amateur Radio Weekly](#) by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- [Experimental Radio News](#) by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- [RTL-SDR Blog](#) - *Excellent* coverage of Software Defined Radio units.
- [TAPR Packet Status Register](#) has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- [HB9BLA Wireless](#) by Andreas Spiess HB9BLA
- [KM6LYW Radio](#) by Craig Lamparter KM6LYW (home of the [DigiPi project](#))
- [Modern Ham](#) by Billy Penley KN4MKB
- [Tech Minds](#) by Matthew Miller M0DQW

Zero Retries is currently using the [Substack email publishing platform](#) to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join **1500+** other subscribers:

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Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Social Media:

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

[Zero Retries / N8GNJ on Mastodon](#)

Zero Retries (N8GNJ) is also on Bluesky — [@n8gnj](#) — just click:

[Zero Retries / N8GNJ on Bluesky](#)

Email issues of Zero Retries are “instrumented” by [Substack](#) to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA, and linked to the Internet via [Starlink Satellite Internet Access](#).

2024-04-26

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[1](#)

Though, I'll guess, that there is experimentation or actual use of sectorized antennas. That approach could be reasonably lightweight and requires only a modest antenna switching unit.

[2](#)

Example - I suggested the creation of the [Masters Communications BCM-6](#), and it was a product less than a month later. That was just cool!